US005087671A

United States Patent [19]

Loeppky et al.

[11] Patent Number: 5,087,671

[45] Date of Patent: Feb. 11, 1992

[54] **POLYMERS FOR SCAVENGING NITROSATING AGENTS**

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[21] Appl. No.: **543,349**

[22] Filed: **Jun. 25, 1990**

[51] **Int. Cl.**[5] **C08F 8/00**

[52] **U.S. Cl.** **525/328.2**; 525/326.7; 525/328.8; 210/690; 210/692

[58] **Field of Search** 525/374, 376, 377, 328.2, 525/326.7, 328.8, 359.3; 564/2; 210/690, 692

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Attorney, Agent, or Firm—Haverstock, Garrett and Roberts

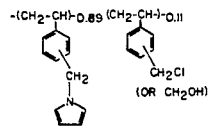
[57] **ABSTRACT**

This invention relates to polymers that can be used to remove or sequester nitrosating agents such as nitrous acid, nitrous esters or thio-esters, nitrous anhydrides, nitrosyl halides, metal nitrosyls, inorganic metal nitrite complexes or similar nitrosating agents from fluid mixtures. This prevents the nitrosating agents from reacting with amines or other nitrogen-containing compound to form nitrosamines or other N-nitroso compounds, which are carcinogenic, in products such as cosmetics and other personal care items, shampoo, pesticides, rubber and rubber chemicals, commercial chemicals and prodcuts formulated from them, and metalworking fluids.

The reactive groups of this invention can be classified into three categories: (1) unsaturated electron-rich aromatic molecules such as pyrrole; (2) reducing agents such as hydroquinone; and (3) amine groups and other amino compounds.

The incorporation of reactive groups into polymeric molecules as described herein provides several advantages. For example, the polymers can form insoluble particles; the particles can be loaded into a filter bed through which a fluid can be passed, or they can be stirred into a mixture before or during a reaction and subsequently removed by filtration, settling, or other steps. Water-soluble polymeric backbones such as polyethyleneimine can be used if desired, and will provide certain advantages in some situations. Various polymers described herein have been demonstrated to be effective in scavenging nitrosating agents from fluids before an amine is added; some are also effective under competitive reaction conditions.

38 Claims, 2 Drawing Sheets



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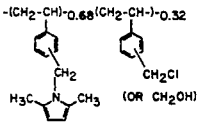

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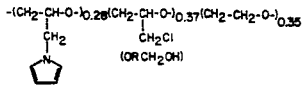

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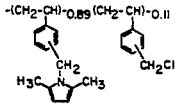

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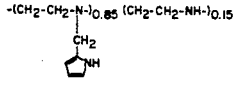

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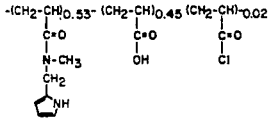

POLYMER VI